
Remote IPE acceptance testing

This section describes the acceptance testing of the Meridian 1 Remote IPE and the fiber-optic link connecting Meridian 1 to the Remote IPE at distances of up to 15 miles for single-mode fibers. The purpose of acceptance testing is to verify that the functions and features of the Remote IPE are operating correctly and that the link is operating as intended.

Acceptance testing overview

Acceptance testing is conducted after the system has been installed, powered up, and appears to be functioning correctly, that is, all LEDs, displays, and system messages indicate that the system is operating correctly. The Remote IPE acceptance testing should be conducted after:

- A previously installed Meridian 1 system is upgraded with Remote IPE equipment and generic software X11 release 19 or higher and operates correctly without Fiber Remote Multi-IPE Interface connection to Meridian 1 and Remote IPE equipment
- A newly installed system with Remote IPE equipment using generic software X11 release 19 higher appears to operate correctly

Acceptance testing verifies the operation of Meridian 1 functions and features at the remote site equipped with Fiber Remote Multi-IPE Interface units and the Remote IPE.

Acceptance testing consists of:

- Checking the system
- Preparing the system for testing
- Testing Meridian 1 functions at the Remote IPE site

Checking the system

After Remote IPE site has been installed and configured, you can visually inspect Remote IPE cards and to make sure that they are operating correctly, observe their LEDs:

- On the Superloop Network card at the local site, check the card LED located at the top of the faceplate. If the LED on the Superloop Network card is Off, the card is enabled and operating correctly. If the card LED is Off and the Fiber Remote Multi-IPE Interface alarm LEDs are On, the card is enabled and operating but the Fiber Remote Multi-IPE Interface or the fiber-optic link is faulty. If the card LED is On, the card is disabled or faulty. To enable the Superloop Network card or to correct a problem, go to “Remote IPE fault isolation and correction” on page 132 in the Maintenance section of this manual.
- On the Peripheral Controller card at the remote site, check the card LED located at the top of the faceplate. If the LED on the Peripheral Controller card is Off, and the Fiber Remote Multi-IPE Interface alarm LEDs are also Off, the card and Fiber Remote Multi-IPE Interface are operating correctly. If the card LED is Off and the Fiber Remote Multi-IPE Interface alarm LEDs are On, the card is enabled and operating but the Fiber Remote Multi-IPE Interface or the fiber-optic link is faulty. If the card LED is On, the card is disabled or faulty. To enable the Peripheral Controller card or to correct a problem, go to “Remote IPE fault isolation and correction” on page 132 in the Maintenance section of this manual.
- Check the hexadecimal display on the Peripheral Controller card. Refer to Appendix A to identify hexadecimal codes displayed by the Peripheral Controller card during self-test.

If the display and all indicator LEDs on the Remote IPE equipment indicate good operating conditions, the equipment is functional and you may proceed with setting up the necessary equipment for this test.

Setting up test conditions

To conduct acceptance testing, you must have a setup that can verify basic Meridian 1 functions and features initiated and terminated at the Remote IPE site. You may be able to use the system as configured at the site according to the customer requirements and not have to modify the configuration to perform the acceptance testing.

To conduct the acceptance testing, make sure that the Remote IPE at the remote site contains at least one IPE (line) card with at least two telephones connected to its subscriber loops. If possible, use some 2500 telephones to check the ringing generator and some digital telephones to check the dual tone multifrequency (DTMF) operation. Also, make sure that an MMI terminal is connected to the MMI port through the Fiber Remote Multi-IPE Interface unit.

Performing acceptance testing

Since functions and features at the Remote IPE site are identical to functions and features at the local Meridian 1 local site, the main purpose of acceptance testing is to verify that fiber-optic equipment is functioning correctly. This can be accomplished by:

- performing basic voice calls
- using the MMI terminal to configure and maintain Remote IPE and Fiber Remote Multi-IPE Interface equipment
- checking the protection switching of the fiber-optic link

Voice calls

A voice call can be established between two voice terminals across a network, between two terminals on the same PBX, and even between two terminals on the same line card.

Acceptance testing of Remote IPE voice calls is conducted when testing the following basic system features supported by telephone sets connected to subscriber loops at the remote site:

- placing a call to the remote site
- placing a call in call hold/call retrieve

Placing a call to the remote site

From the local Meridian 1 site, place a call to a Remote IPE site by dialing a remote station directory number (extension number).

Note: Meridian 1 treats Remote IPE subscriber loops as local loops; thus, you need to dial only the extension number to access that station.

To perform a call test:

- 1 From a terminal at the local Meridian 1 site, dial a terminal at the Remote IPE site and establish an active call connection.
- 2 Verify voice transmission by talking with the person at the other terminal. Make sure the speech is clear in both directions.
- 3 Maintain the connection and ask the person at the remote site to test basic calling features such as call hold/call retrieve.
- 4 Terminate the call.

Call hold/call retrieve

Call hold is used to place an active call on hold in order to answer an incoming call or place an outgoing call. After releasing an incoming or an outgoing call, you can retrieve the call on hold.

To perform a call hold/call retrieve test:

- 1** From a terminal at the local Meridian 1 site, dial a terminal at the Remote IPE site and establish an active call connection.
- 2** Verify voice transmission by talking with the person at the other terminal.
- 3** Press the Hold key at the remote site to place the active call on hold.
Note: To find out how to use the feature keys on different terminals, consult the user manual supplied with the terminal.
- 4** Now, place an outgoing call from the terminal at the remote site by dialing an idle terminal located at the local Meridian 1 site.
- 5** Complete this outgoing call by first checking the voice clarity in both directions, and hang up.
- 6** Have another terminal call you while the first call is still on hold.
- 7** Answer the incoming call and place it on hold.
- 8** Retrieve the call first held.
- 9** Complete the call and hang up.
- 10** Retrieve the second call on hold.
- 11** Complete the call and hang up.

You may repeat this test for terminals connected to different subscriber loops on the same line card or for different subscriber loops on different line cards in the Remote IPE module. By making these calls, you generate traffic, which will be shown in the traffic report.

Checking the MMI terminal operation

Connect an MMI terminal to the Fiber Remote Multi-IPE Interface unit at the local site and another MMI terminal to the Fiber Remote Multi-IPE Interface at the Remote IPE site.

- 1 Set the current mode of the MMI terminal to MMI mode by logging on and by entering **L** or **L xx**, where **xx** is the Fiber Remote Multi-IPE Interface address in a multiple unit daisy-chain configuration. Enter the password **FIBER** in solid caps.
- 2 Check the status of near-end superloops and the fiber-optic link by executing the **D S [P]** command.
- 3 Check the status of the superloops and the fiber-optic link at the far-end by executing the **D S D** command. This command is sent over the fiber-optic link to the Peripheral Controller card for execution.
- 4 Check the response to this command for the local and remote sites.
- 5 Check the log file content by executing the **D A [P]** to print near-end log messages from the file starting with the oldest message. Examine the messages.
- 6 Check the log file content by executing the **D A D** to print far-end log messages from the file starting with the oldest message. Examine the messages.

Additional exercise of the MMI terminal will be conducted when testing the fiber-optic link protection switching.

Checking link protection switching

To verify that the fiber-optic link protection switching is operating correctly, conduct the following tests with the span:

- manual switch-over
- forced switch-over

Note: These tests can be conducted only with a redundant link configuration.

Manual switch-over

This is a bidirectional switch-over. To conduct this test:

- 1** Check the status of the fiber-optic link by executing the **D S** command from the MMI terminal. Make sure that both the primary and the redundant links are functional without an alarm condition on the Fiber Remote Multi-IPE Interface faceplate.
- 2** Establish a call from the Remote IPE to the local Meridian 1 site. Refer to “Voice calls” on page 110 to establish the call.
- 3** Assuming that the traffic is carried by the primary link, perform the following step.
- 4** Switch the link to the secondary by unplugging the primary link connector from the Fiber Remote Multi-IPE Interface faceplate XMIT A connector.
- 5** Verify that the call is still established over the secondary link.
- 6** Reconnect the link ST optical connector into the XMIT A connector on the Fiber Remote Multi-IPE Interface faceplate.
- 7** Switch the link back to the primary by unplugging the secondary link connector from the Fiber Remote Multi-IPE Interface faceplate XMIT B connector.
- 8** Verify that the call is still established over the primary link.
- 9** Reconnect the link ST optical connector into the XMIT B connector on the Fiber Remote Multi-IPE Interface faceplate.

Forced switch-over

This is a bidirectional switch-over. To conduct this test:

- 1 Check the status of the fiber-optic link by executing the **D S** command from the MMI terminal. Make sure that both the primary and the redundant links are functional without an alarm condition on the Fiber Remote Multi-IPE Interface faceplate.
- 2 Establish a call from the Remote IPE to the local Meridian 1 site. Refer to “Voice calls” on page 110 to establish the call.
- 3 Assuming that the traffic is carried by the primary link, perform the following step.
- 4 Switch the link to the secondary by executing the Set Link command **S L B** to select the redundant link **B** using the MMI terminal.
- 5 Verify that the call is still established over the secondary link.
- 6 Executing the Set Link command **S L A** to select the primary link **A** using the MMI terminal.
- 7 Verify that the call is still established over the primary link.

Fault recovery test

This test verifies the recovery of the fiber-optic link and the Fiber Remote Multi-IPE Interface units after the loss of power at one end. To perform this test:

- 1 Unplug the power connector on the Fiber Remote Multi-IPE Interface unit I/O panel.
- 2 Observe that all LEDs on the unit are OFF.
- 3 Reinstall the power source connector into the Fiber Remote Multi-IPE Interface unit I/O panel power connector. Observe the LEDs.
- 4 The Power LED on the Fiber Remote Multi-IPE Interface should come ON and stay ON upon completion of a successful self-test.
- 5 Press the Reset button to turn OFF the alarm LEDs. They should turn OFF and stay OFF if the fiber-optic link recovered from the power failure.
- 6 Place a call across the link to verify its operation.

- 7 Place the MMI terminal in the Host SDI mode and load the LD 60 overlay to switch the system clock controller from 0 to 1 or vice versa.
- 8 Switch system clock from active to standby by executing the **SWCK** command.
- 9 Get status of system clock 0 or 1 by executing the **SSCK 0, 1** command.
- 10 Check the established call(s) and make sure they have not been dropped. If the call(s) are not established, the Phase-Lock-Loop (PLL) is out of lock due to clock switching. The status message may be XM1000 to indicate a glitch and PLL is unlocked. Find the problem and reestablish the PLL lock.

Removing the test setup

After acceptance testing has been completed and the results show that the system is operating correctly, you should remove the setup you used to conduct the testing and restore equipment according to the customer configuration.

If you used the actual customer configuration to perform these tests, you do not have to change or remove the setup.

Generating traffic reports

Use system traffic report to identify calls made during acceptance testing from the Remote IPE site and to the Remote IPE site.

To verify traffic generated during acceptance testing, use the following command to print the report:

TOPS r r

The parameters for this command are:

r r are report options. This must be one or more of the following numbers:

- 1 = Network traffic report
- 2 = Service loops traffic report
- 5 = Selected terminals traffic report

For more information on traffic reports, refer to the Traffic control program LD 02 in *X11 input/output guide* (553-3001-400) and *Traffic measurement formats and output* (553-2001-450).